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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/765,533
Filing Date	01/27/2004
First Named Inventor	Richard Fink
Art Unit	2883
Examiner Name	James Hughes
Attorney Docket Number	12179-P103C1
Total Number of Pages in This Submission	14

ENCLOSURES (*Check all that apply*)

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) ____________
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

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Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Winstead Sechrest & Minick P.C.		
Signature	[signature]		
Printed name	Kelly K. Kordzik		
Date	12/02/2005	Reg. No.	36,571

CERTIFICATE OF TRANSMISSION/MAILING

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Signature	Toni Stanley		
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FEE TRANSMITTAL
For FY 2005

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 250.00

Complete if Known	
Application Number	10/765,533
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METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order

☑ Deposit Account ☐ None

Deposit Account Number: 23-2426

Deposit Account Name: Winstead Sechrest & Minick P.C.

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FEE CALCULATION

1. BASIC FILING FEE

Fee Description	Fee ($)	Small Entity Fee ($)	Fee Paid($)
Utility Filing Fee	790	395	
Design Filing Fee	350	175	
Plant Filing Fee	550	275	
Reissue Filing Fee	790	395	
Provisional Filing Fee	160	80	

Subtotal (1) $ ____

FEE CALCULATION (continued)

2. EXTRA CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20	50	25
Each independent claim over 3	200	100
Multiple dependent claims	360	180
For Reissues, each claim over 20 and more than in the original patent	50	25
For Reissues, each independent claim more than in the original patent	200	100

Total Claims ____ - 20 or HP = **Extra Claims** ____ x **Fee ($)** ____ = **Fee Paid ($)** ____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims ____ - 3 or HP = **Extra Claims** ____ x **Fee ($)** ____ = **Fee Paid ($)** ____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims **Fee ($)** ____ **Fee Paid ($)** ____

Subtotal (2) $ ____

3. OTHER FEES

Fee Description	Fee ($)	Small Entity Fee ($)	Fee Paid($)
1-month extension of time	120	60	
2-month extension of time	450	225	
3-month extension of time	1,020	510	
4-month extension of time	1,590	795	
5-month extension of time	2,160	1,080	
Information disclosure stmt. fee	180	180	
37 CFR 1.17(q) processing fee	50	50	
Non-English specification	130	130	
Notice of Appeal	500	250	
Filing a brief in support of appeal	500	250	250
Request for oral hearing	1,000	500	
Other: ____			

Subtotal (3) $ 250

SUBMITTED BY

Signature	[signature]	Registration No. (Attorney/Agent) 36,571	Telephone 512.370.2851
Name (Print/Type)	Kelly K. Kordzik		Date 12/02/2005

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Fink et al.	:	Before the Examiner: James Hughes
Serial No.: 10/765,533	:	Group Art Unit: 2883
Filed: January 27, 2004	:	
Title: LARGE AREA ELECTRON SOURCE	:	

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence (along with any item referred to as being attached hereto) is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on 12-2, 2005.

Toni Stanley
Signature

Toni Stanley
(Printed name of person certifying)

I. REAL PARTY-IN-INTEREST

The real party-in-interest is Nano-Proprietary, Inc., which is the assignee of the entire right and interest in the present Application.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Appellants, the Appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 7-19 are pending in the Application, and also stand rejected.

IV. STATUS OF AMENDMENTS

There were no amendments to the claims or Specification filed after the Final Rejection.

V. SUMMARY OF THE INVENTION

In applications for electron beams, a large, uniform source is desirable. A uniform, large area beam would allow quicker processing of the items being irradiated. More important, the dose calibration would be made simpler. Page 3, lines 14-17.

To make a large, uniform source of electrons, a flat, large area cathode can be used such that many sources of electrons are available to many windows. This can be done in different ways. In all of the embodiments, any cold cathode emitter could be utilized, such as a carbon cold cathode, a micro-tip array, a film of carbon nanotubes, amorphic diamond emitters, etc. Page 3, lines 18-22.

Referring to FIGURE 2, the cathode 201 can be a blanket emitter with a large, metal foil window 202 with a support structure 203. A voltage source can be utilized to create an electric field to extract electrons from the cathode 201 through the foil windows 202 to create the beam of electrons 205 to irradiate a large area. Vacuum envelope 206 may encase the cathode 201 with the support structure 203. Page 3, lines 23-27.

Referring to FIGURE 8, there is illustrated a method for irradiating objects, such as mail 802, which may pass underneath the electron source 801 on a conveyor belt 803. The electron beams will pass through the envelope. Some energy may be lost at each surface of the letter killing or rendering harmless bacteria or virus species or toxic or other dangerous chemical compounds. Page 5, lines 24-28.

VI. REJECTIONS

1. Claims 13 and 18 are objected to as being unclear.

2. Claims 11 and 17 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

3. Claims 7-9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Rangwalla et al.* (U.S. Patent No. 6,426,507).

4. Claims 10-13 and 15-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Rangwalla* in view of *Zettl et al.* (U.S. Patent No. 6,057,637).

5. Claims 14 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Rangwalla* in view of *Goth et al.* (2002/0006489).

VII. OBJECTIONS TO CLAIMS 13 AND 18

The Examiner objects to claims 13 and 18 as being unclear because the term "graphite diamond" is unclear in light of the Specification. *See* Office Action mailed 04/07/2005, ¶1. The term "graphite diamond" appears in the text of the Specification, which states, "The carbon cold cathode may consist of carbon nanotobues (single wall and multiwall) and carbon thin films, including diamond-like carbon and mixtures of amorphous carbon, graphite diamond and fullerene-type of carbon materials." *See* Specification, page 5, ¶2. Applicants have carefully reviewed this language in the Specification and believe that the misunderstanding is due to a typographical error where a comma was left out between the word graphite and diamond. After the appeal process has completed, Applicants respectfully request an opportunity to amend the Specification and claims accordingly.

VIII. REJECTIONS UNDER 35 U.S.C. § 112

Claims 11 and 17 stand rejected under 35 U.S.C. § 112 ¶1 because the "original specification does not teach the cold cathode comprising amorphic diamond." *See* Office Action ¶2. Further, "it is unclear what constitutes amorphic diamond." *See id.* This rejection is traversed. Claim 17 does not contain the term "amorphic diamond;" however, claim 16 does contain the term. Therefore, Applicants address the rejections to claims 11 and 17 as rejections to claims 11 and 16.

Amorphic diamond is a well-known term in the art. This is as evidenced by the twenty issued patents containing and describing the meaning of amorphic diamond. The Examiner is requested to refer to at least the following patents:

5,098,737
5,548,185
5,600,200
5,601,966
5,614,353
5,652,083
5,675,216

5,679,043
5,686,791
5,703,435
5,763,997
6,127,773

The Specification contains references to amorphic diamond therein. As a result, the § 112 rejection is traverse.

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IX. REJECTIONS UNDER 35 U.S.C. § 102(b)

Claims 7-9 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,426,507 ("*Rangwalla*"). A claim is anticipated only if each and every element as set forth in the claim is found in a single prior art reference. MPEP § 2131. Applicants traverse the rejections to claims 7-9 because *Rangwalla* does not disclose every element of the claims.

Claim 7 recites "a cold cathode, wherein the cold cathode is substantially flat." The Specification indicates that "any cold cathode emitter could be utilized, such as a carbon cold cathode, a micro-tip array, a film of carbon nanotubes, amorphic diamond emitters, etc." *See* Specification, page 3, ¶4. The Examiner apparently ignores the recitations for a cold cathode. *See* Office Action, ¶3. Instead, the Examiner relies on *Rangwalla's* item 112, which is disclosed as a filament. *Ranwalla's* filament shown as item 112 is not a cold cathode. In fact, *Rangwalla* discloses that "Filament 112 then glows white hot and generates a cloud of electrons." *Rangwalla*, col. 4, lines 40-42. Further, *Rangwalla* discloses that the "tungsten filament is heated to about 2400 K." *See Rangwalla*, col. 1, lines 41-42. *Rangwalla's* white hot filament is not a cold cathode. Therefore, *Rangwalla* does not disclose every limitation of claim 7 and claim 7 is allowable under 35 U.S.C. § 102 over *Rangwalla*. Accordingly, Applicants respectfully request the withdrawal of any claim rejections based on *Rangwalla*.

The Examiner has responded by asserting in the advisory action that *Rangwalla* teaches in column 5, lines 1-3 that the emitter 112 may operate at -110,000 V and the foil

support assembly 140 may be grounded or set at 0 V. As a result, the Examiner asserts that the emitter may comprise a cold cathode. Applicants respectfully traverse. Instead, this is merely referring to voltages that are utilized to accelerate the electrons that have been generated by the hot filament. In the Abstract of *Rangwalla*, it is stated:

> ... electrons are generated by heating at least one tungston filament. The electrons are then extracted to travel at a high speed to the foil support assembly which is set at a much lower voltage than the particle beam generating assembly.

Column 4, lines 40-44 recites:

> Filament 112 then glows white hot and generates a cloud of electrons. Electrons are then drawn from filament 112 to areas of higher voltage, since electrons are negatively charged particles, as described below and accelerated to extremely high speeds.

In column 4, lines 61-63, *Rangwalla* recites:

> Extractor grid 116 controls the quantity of electrons being drawn from the cloud, which determines the intensity of the electron beam.

As a result of the foregoing, Applicants respectfully assert that it is clear that *Rangwalla* merely teaches the use of the hot filament, and not a cold cathode.

Claims 8-9 recite similar limitations for "cold cathode." Claim 8-9 stand rejected for the same reasons as claim 7. Therefore, for the reasons stated above with regard to claim 7, claims 8-9 are allowable over *Rangwalla* and the corresponding rejections should also be withdrawn.

X. REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 10-13 and 15-18 stand rejected under 35 U.S.C. § 103(a) as obvious over *Rangwalla* in view of U.S. Patent No. 6,057,637 ("*Zettl*"). Hindsight reconstruction is impermissible-the Federal Circuit forbids using the claimed invention as an instruction

manual or "template" to piece together the teachings of the prior art as a basis for obvious rejections. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998) & *In re Fritch*, 972 F.2d 12609 (Fed. Cir. 1992). Applicants respectfully assert the Examiner has used hindsight in piecing together the teachings of the prior art to find a basis to reject claims 10-13 and 15-18. Accordingly, Applicants respectfully request the withdrawal of the rejections of claims 10-13 and 15-18.

As discussed above, *Rangwalla* relates to a particle beam processing apparatus that generates an electron cloud by <u>heating</u> at least one tungsten filament. *See* ABSTRACT. The combination of *Rangwalla* and *Zettl* cited by the Examiner does not disclose any <u>cold cathode</u> as recited in claim 7. Claims 10 and 12 depend from claim 7 and therefore recites the limitations of claim 7.

Regarding claim 11, *Zettl*, taken alone or in combination with the other references, does not disclose any cold cathode that comprises amorphic diamond emitters, as claimed in the present application. Similarly, regarding claim 13, no combination of *Zettl* and the other references discloses any cold cathode that comprises a mixture of amorphous carbon, graphite diamond, and fullerene-type carbon materials. *Zettl* discloses a field emission source comprising a volume of binder and a volume of nanotubes suspended in the binder, where the nanotubes are made essentially from carbon or the combination of carbon, boron, and nitrogen. *See Zettl*, col. 2, lines 21-26. Nowhere does the combination of *Rangwalla* and *Zettl* teach or suggest any amorphic diamond emitters as claimed in the present application. For at least these reasons, claims 11 and 13 are allowable.

In addition to not disclosing every element of the rejected claims, there is no motivation to combine *Rangwalla* and *Zettl*. *Zettl* and *Rangwalla* are fundamentally different. *Zettl* states as an objective "to provide a field emission electron source ...that do[es] not require ultra high vacuum. *See Zettl*, Col. 1, line 67-Col. 2, line 3. Contrary to this stated objective of *Zettl*, *Rangwalla* discloses a vacuum chamber shown as item 114 that houses a hot filament shown as item 112. *Rangwalla*, vol. 4, lines 35-37 & Fig. 1.

The Examiner states as motivation that it would have been obvious "to employ a plurality of carbon nanotubes, graphite diamond, amorphic diamond, or a mixture of these materials with amorphous carbon...and one would have been motivated to do so because as *Zettl* teaches, carbon nanotobues are capable of proving a reliable, nonfragile, and robust cold cathode (field emission) electron sources." These are the Examiner's subjective opinions and do not represent objective evidence that one or ordinary skill in the art would have been motivated, at the time the invention was made, to combine or modify the references to reach the claimed subject matter.

Claims 15-18 recite limitations similar to claims 10-13 and for the reasons stated above, claims 15-18 are allowable over *Rangwalla* in view of *Zettl*. Therefore, claims 10-13 and 15-18 are allowable over *Rangwalla* in view of *Zettl*.

Claims 14 and 19 stand rejected under 35 U.S.C. § 103(a) as obvious over *Rangwalla* in view of *Goth* (U.S. Patent No. (2002/0006489). Claims 14 and 19 depend from claims 7 and 8, respectively. As stated above, *Rangwalla*, taken alone or in combination with the other references, does not disclose every element of claim 7 or 8. For example, *Rangwalla* does not disclose a cold cathode, but instead discloses a hot tungsten filament. Further, there is no motivation to combine *Rangwalla* and *Goth*. The Examiner states as motivation, it would have been obvious "to employ an envelope structure with five walls, as commonly employed in the art; and one would have been motivated to do so because this would provide a stable structure of the field emission device." *See* Office Action mailed 4/7/2004, ¶5. These are the Examiner's subjective opinions and are unsupported by objective evidence for combining the references. Therefore, claims 14 and 19 are allowable over the cited references and Applicants respectfully request the withdrawal of the rejections to these claims.

Respectfully submitted,

WINSTEAD SECHREST & MINICK P.C.

Attorneys for Appellants

By:______________________________
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CLAIMS

7. An electron source comprising:

a cold cathode, wherein the cold cathode is substantially flat;

an evacuated vacuum envelope enclosing the cold cathode;

circuitry for creating an electric field sufficient to cause an electron beam to be emitted from the cold cathode; and

a window in the evacuated vacuum envelope to permit passage of the electron beam externally from the envelope.

8. A method for operating an electron source, comprising the step of activating an electric field to cause an emission of an electron beam from a cold cathode within an evacuated envelope in a manner so that the electron beam passes externally from the envelope through a window in the envelope, wherein the cold cathode is substantially flat.

9. (original) The method as recited in claim 8, further comprising the step of positioning an object relative to the electron source so that the electron beam emitted externally from the electron source irradiates the object, wherein the object is external to the evacuated envelope.

10. The electron source of claim 7, wherein the cold cathode comprises a plurality of carbon nanotubes.

11. The electron source of claim 7, wherein the cold cathode comprises amorphic diamond emitters.

12. The electron source of claim 10, wherein the plurality of carbon nanotubes comprise single wall nanotubes.

13. The electron source of claim 10, wherein the cold cathode comprises a mixture of amorphous carbon, graphite diamond, and fullerene-type carbon materials.

14. The electron source of claim 7, wherein the evacuated vacuum envelope is formed within a vessel, wherein the vessel is formed by a first wall substantially parallel to a second wall, wherein the vessel is formed by a third wall substantially parallel to a fourth wall, wherein the first wall is substantially perpendicular to the third wall, wherein the second wall is substantially perpendicular to the fourth wall, wherein the vessel comprises a fifth wall coupled to the first, second, third, and fourth walls, wherein the cold cathode is coupled to the fifth wall, wherein the fifth wall is substantially parallel to the window.

15. The method as recited in claim 8, wherein the cold cathode comprises a plurality of carbon nanotubes.

16. The method as recited in claim 8, wherein the cold cathode comprises amorphic diamond emitters.

17. The method as recited in claim 15, wherein the plurality of carbon nanotubes comprise single-wall nanotubes.

18. The method as recited in claim 15, wherein the cold cathode comprises a mixture of amorphous carbon, graphite diamond, and fullerene-type carbon materials.

19. The method as recited in claim 8, wherein the evacuated vacuum envelope is formed within a vessel, wherein the vessel is formed by a first wall substantially parallel to a second wall, wherein the vessel is formed by a third wall substantially parallel to a fourth wall, wherein the first wall is substantially perpendicular to the third wall, wherein the second wall is substantially perpendicular to the fourth wall, wherein the vessel comprises a fifth wall coupled to the first, second, third, and fourth walls, wherein the cold cathode is coupled to the fifth wall, wherein the fifth wall is substantially parallel to the window.